[Extracts From]

TYPOGRAPHICAL PRINTING-SURFACES

THE TECHNOLOGY AND MECHANISM OF THEIR PRODUCTION

BY

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AUTHOR OF "A YEAR OF LIFE"; "THE PRICE OF THE BISHOP"; "PRAIRIE PICTURES" "BITS OF BRAZIL"; "TORRIBA: A PRINCESS OF THE AMORAYES"; ETC. ETC.

Extracts Concerning the Nuernberger-Rettig (later known as the "Universal") Typecaster

LONGMANS, GREEN, AND CO.
39 PATERNOSTER ROW, LONDON
FOURTH AVENUE & 30TH STREET, NEW YORK
BOMBAY, CALCUTTA, AND MADRAS

1916

This document contains those pages in Legros and Grant's Typographical Printing Surfaces (1916) which deal with the Nuernberger-Rettig (also known as the "Universal") typecasting machine (exclusive of references to it or to its inventors in the list of patents and the index).

The scans from which this digital version were made were done from an original 1916 copy of this work.

Scanned in 2008, and assembled and reprinted in 2010 by
Dr. David M. MacMillan (dmm@Lemur.com) for
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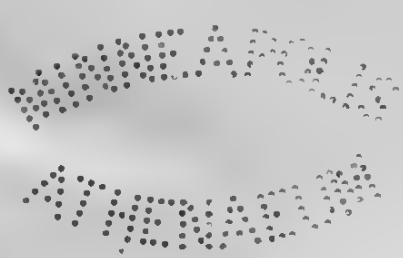

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these operations were formerly performed by hand. A few typical examples of breaks may now be considered :—

1. *Mason's break,* fig. 5, which has been adopted in type-moulds prior to the introduction of self-dressing matrices. Two inclined recesses are formed in the breaks of the mould which produce projecting shoulders on the tang; these are caught by the inclined faces of the breaks and the upward movement of the top break causes a greater rotational movement of the tang than the movement of the mould-faces permits to the type-body, thus causing the tang to be twisted away from the body of the type.

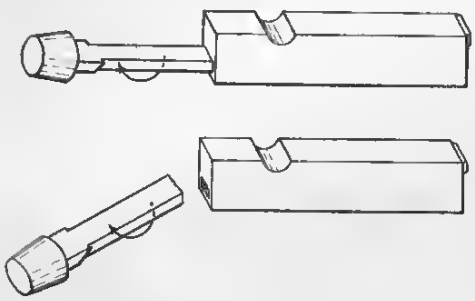

FIG. 5.—*Mason's break.*

2. *Non-dressing break,* fig. 6. An improvement made in moulds fitted with Mason's breaking arrangement, consisted in fitting two semicylindrical wires, each containing one-half of a cylindrical hole having its axis at right angles to the axes of the wires, which are coincident. The tang-wire requires to be set to position for each alteration in set width of the matrix which is in use. By the introduction of self-dressing matrices, the type were ejected finished from the mould, the break being effected in the small cylindrical portion of the tang contained between the wires and occurring below the surface of the foot.

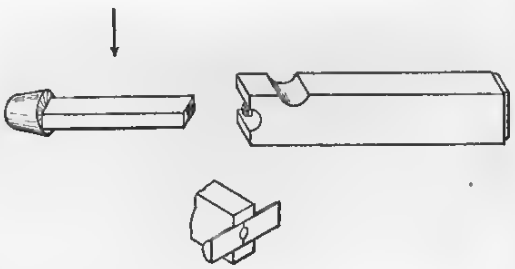

FIG. 6.—*Non-dressing break.*

3. *The Davis break,* fig. 7. In this a triangular wire having a short slot at one end is fitted to the lower half of the mould. The type is broken away from the tang by the action of the drag fitted to the upper half of the mould, when the mould commences to open, and the tang is subsequently ejected from the wire by means of a pusher.

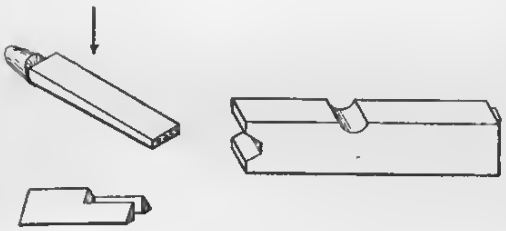

FIG. 7.—*Davis break.*

4. *The Nuernberger-Rettig break,* fig. 8. In this break two sections of cylindrical surfaces are formed in the top and bottom halves

of the mould into which they project from the tang-blocks; these are guided by plates in, and are spring-operated from, the carriages. After the cast is completed and when the pressure against the tang-blocks has been removed, these retire under the action of the springs, dragging the tang with them and subsequently ejecting it. The break takes place within the depression at the foot of the type, but the method evidently requires the use of springs of considerable strength when the set width of the type is large.

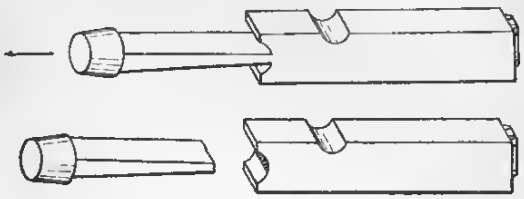

FIG. 8.—*Nuernberger-Rettig break.*

5 *The Stringer break*, fig. 9. Two **V**-shaped nicks are formed one on each side of the tang by means of inset pieces working in conjunction with the mould. The type, after ejection from the mould by the action of the body-slide, is automatically passed into a raceway, and the tang fractured by a blow or thrust.

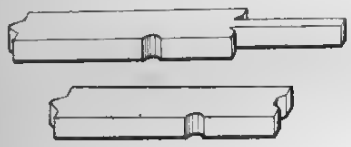

FIG. 9.—*Stringer break.*

6. *The Typograph break*, fig. 10. In this form, which is applied to a slug-casting machine, the jet does not run the whole length of the slug, and a portion of the base of the slug is depressed over a slightly greater length. The jet is sheared off within the boundary of this depressed surface, the fractured metal coming below the foot which surrounds it on three sides.

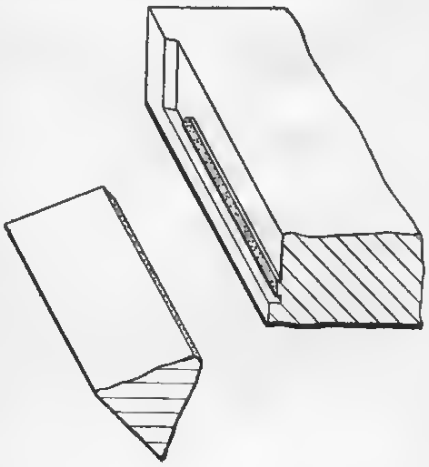

FIG. 10.—*Typograph break.*

7. *The Monotype break*, fig. 11. In the Monotype mould, which casts single type, no provision is made for ensuring that fracture takes place below the surface of the foot, but the tang which joins the body at one edge is sheared off by the movement of the mould, leaving a surface which has been found to be sufficiently true for all practical purposes.

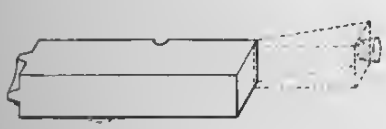

FIG. 11.—*Monotype break.*

8. *The Grantype break*, fig. 12. In the Grantype—which casts a line of single or loose type in one

internal stresses caused by striking, with the result that the character when cast is hollow in the face. This difficulty may be dealt with successfully,

TABLE 41.

Depth of strike of ordinary matrices.

The height of moulds here given includes allowance for contraction.

Typefounder or matrix manufacturer.	Body-size.	Height of mould.	Depth of strike.	Depth of counter.
	Points.	Inch.	Inch.	Inch.
H. W. Caslon & Co., Ltd.	6 to 12	from 0·886 to 0·860	from 0·034 to 0·060	from 0·012 to 0·024
	18 to 72	from 0·860 to 0·832	from 0·060 to 0·088	from 0·026 to 0·060
Miller & Richard	6 to 12	from 0·882 to 0·860	from 0·038 to 0·060	from 0·010 to 0·022
	18 to 72	from 0·860 to 0·806	from 0·060 to 0·114	from 0·022 to 0·062
Stephenson, Blake & Co.	6 to 12	from 0·888 to 0·869	from 0·032 to 0·051	from 0·012 to 0·025
	18 to 72	from 0·868 to 0·827	from 0·052 to 0·093	from 0·025 to 0·060
R. H. Stevens & Co., late V. & J. Figgins	6 to 12	from 0·885 to 0·875	from 0·035 to 0·045	from 0·010 to 0·023
P. M. Shanks & Sons, Ltd.	6 to 18	from 0·885 to 0·860	from 0·035 to 0·060	from 0·010 to 0·030
	24 to 30	0·860	0·060	0·040
The Blackfriars Type Foundry, Ltd.	6 to 18	0·880	0·040	0·020
American Type Founders Co.	6 to 12	0·887 to 0·878	from 0·033 to 0·042	from 0·015 to 0·023
	18	0·856	0·066	0·042
	24 to 72	from 0·847 to 0·832	from 0·073 to 0·088	from 0·020 to 0·070
Grant, Legros & Co., Ltd.	up to 6	0·8865	0·0335	from 0·010 to 0·020
	7 to 14	0·878	0·0420	from 0·010 to 0·020
	16 to 30	0·8615	0·0585	from 0·010 to 0·030
	36 to 72	0·842	0·078	from 0·035 to 0·080
Nuernberger-Rettig	5 to 14	0·890	0·030	
	18 to 48	0·860	0·060	

in some cases, by drilling a hole transversely in the matrix-blank below the centre of the strike, as shown at *a* in fig. 177.

FORMS OF TYPE-MATRICES.

The form of the matrices varies greatly with the machine in which they are used; the simplest form, generally of copper, is that shown in fig. 170,

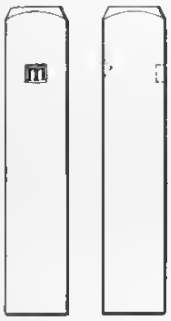

FIG. 170.—*Ordinary matrix.* Full size.

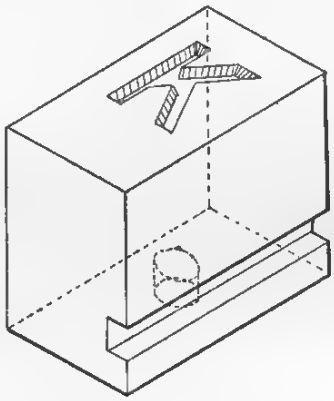

FIG. 171.—*Nuernberger-Rettig matrix.* Enlarged.

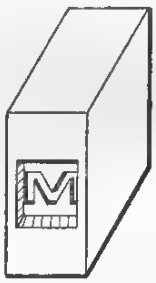

FIG. 172.—*Bhisotype matrix.* Full size.

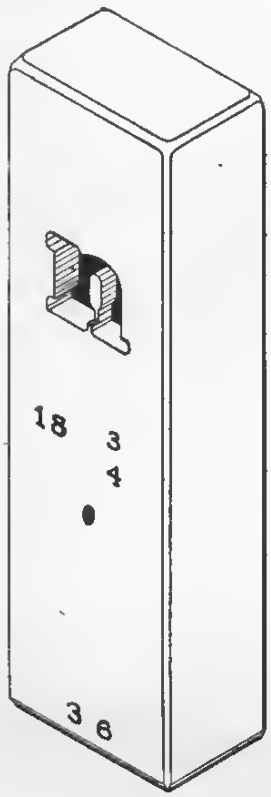

FIG. 173.—*Barth matrix.* Enlarged.

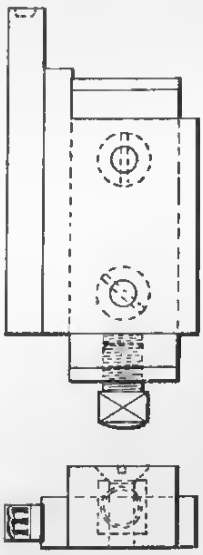

FIG. 174.—*Wicks matrix.* Full size.

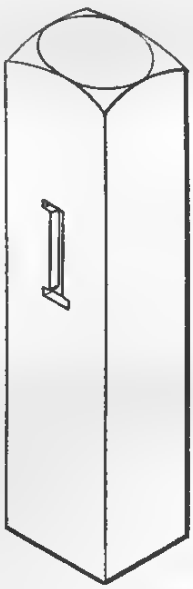

FIG. 175.—*Foucher matrix.* Enlarged.

and is used in the ordinary typecasting machine for casting one character at a time.

The matrices of the Nuernberger-Rettig typecaster, fig. 171, and of

PLATE XVIII.

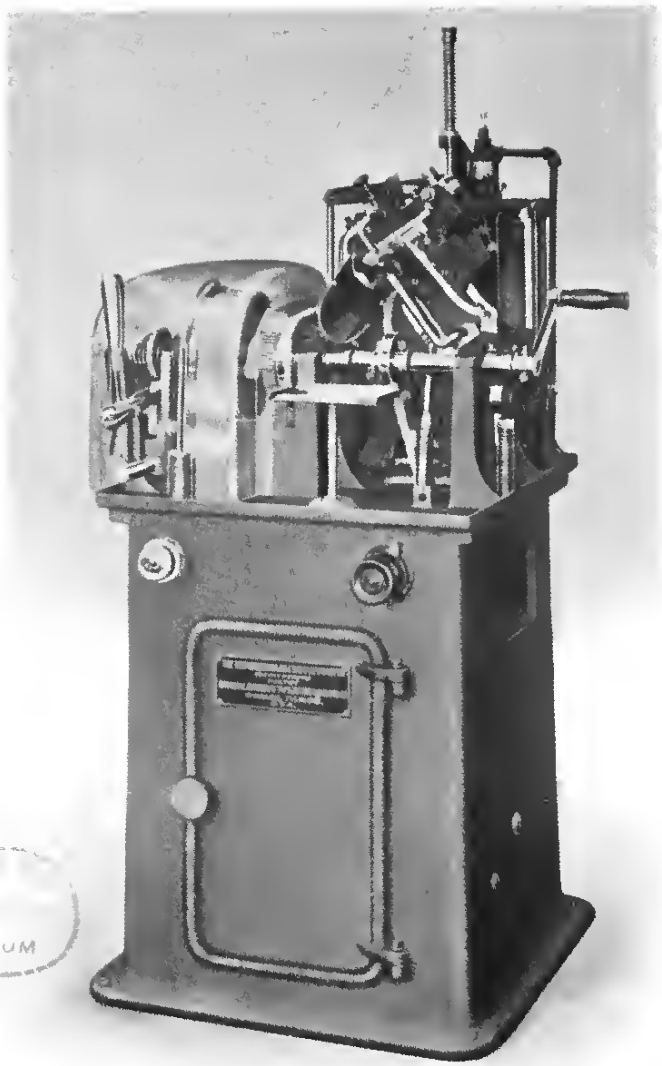

FIG. 292.—*Nuernberger-Rettig typecaster.*

To face page 307.]

the swing frame with the mould is withdrawn from the nipple-plate by the action of the withdrawing-spring, and the opening of the mould commences as in the previously described case ; simultaneously with this the matrix is drawn back to a sufficient distance by the action of the withdrawing-spring acting on the matrix-box or holder. Two thin metal blades mounted on a slide-block are made to travel in the direction in which the type is to leave the mould ; the one blade or pusher on the side adjacent to the metal-pot is formed with a forked end which embraces the dot, or that portion of the tang which was formed in the cavity in the nipple-plate ; the supplemental pusher bears simultaneously or nearly so against the wall or relief projection of the face of the type left clear by the withdrawal of the matrix. The process of ejection by these two pushers is effected by means of a cam carried on the main shaft which operates a lever pin-jointed to the fixed pillar of the machine. This lever raises a spring plunger carried in a spring box, and the upper end of the spring plunger bearing against the end surface of the bent arm of the ejection-lever causes its forked upper end to act on the pin moving the slide-block to which the pushers are attached. The movement of the pushers when completed causes the type to be ejected on to the receiving-stick along which it pushes the last type, previously cast, forward towards the outer side of the machine, type following type in regular order. After the completion of the movement of ejection the finished type stands in the type-race under a presser, and on the return of the swing frame an arm on the jobber-shaft actuates a plunger carried on the swing frame, breaking off the tang from the type ; an alternative method of breaking the type can also be arranged in which the power required is provided by the movement of the swing frame towards the type-race ; a breaking-off lever is carried on a pin on the side of the type-race next to the metal-pot, and a fixed cam-path, over which the tail of the lever travels, causes the depression of the lever and breakage of the tang to be effected before the completion of the movement of the swing frame towards the metal-pot.

In this form of machine the nipple-plate is usually made of two thicknesses of metal, the one containing the cup-shaped depression for the end of the nozzle, and the circular hole for the jobber, while the other part is formed with a tapered elongated hole for producing a form of dot which, when embraced by the forked end of the pusher, will prevent the turning over of the type during ejection.

In this machine and in that last described it is possible to use a matrix-box or holder suitable for carrying either Linotype or Monotype matrices in place of those of ordinary form ; moreover, it is possible to use a box for containing two or more Linotype matrices, fig. 94, p. 108, and thus to cast complete logotypes.

Nuernberger-Rettig.—Another pivotal typecasting machine, of American origin, which in the last year or two has appeared on the market and has been considerably advertised, is the Nuernberger-Rettig, fig. 292,

plate XVIII. Apart from neatness of design and solidity of construction, this pivotal casting machine does not call for any particular remark. The main difference between it and its congeners lies in its mould, which has a somewhat peculiar method of removing the tang from the type when cast. This, however, has been treated of elsewhere (pp. 12 and 13) in this work, and here requires no further comment.

Speed of pivotal machines.—The maximum speeds claimed for pivotal casting machines are about 3000 type per hour for pica, increasing up to 6000 type per hour for 6-point and smaller bodies. Owing to the fact that the moulds of pivotal machines are not generally water-cooled and only occasionally have an air-blast fitted for cooling, it is frequently necessary to stop to cool the mould, and for this reason the figures given do not correspond to the mean rate of output which can be maintained for a longer period.

In the case of large work, from 24-point to 72-point, the pivotal machine requires to be run at a considerably-reduced speed, for which purpose it is usually fitted with a reducing-gear, and in some cases with a gear which cuts out the driving shaft for one or more revolutions, allowing it to turn freely and then throwing it into gear again. This is done in order to imitate the action of the hand-caster who allowed a dwell, in turning the handle, at the moment when the mould had been filled, of sufficient length to ensure the solidifying of the type before the mould was allowed to open. In some of the large-work machines, fig. 293, plate XIX, used for casting quotations, special arrangements of mould are made for coring these hollow. The core must of necessity be withdrawn before the quad is ejected from the mould. Somewhat similar arrangements are also necessary for casting large type of bridge-section, a form which is sometimes adopted to effect a reduction in weight.

In all ordinary pivotal machines a different mould is required for each body, but the mould is adjustable for those variations in set which occur in a fount of type ; a different mould of each body is also required for spaces and quads, on account of the difference in height-to-paper, and, where a nick is fitted, yet another mould is required for the 2, 3, or 4-em quads. As the nicks differ for different faces of the same body, a suitable mould is required for each different arrangement of nick. The nicks on the body are produced in casting, but the removal of the tang and the cutting of the heel-nick, as has been said, must be performed subsequently, except in those machines like the Nuernberger-Rettig or the Davis, in which special provision is made for breaking off the tang without leaving any projection beyond the feet of the type.

Rapid typecasters.—Among other classes of machines to be considered are rapid typecasters, casting finished type at a high rate of speed from a single mould ; the only one known to the authors is one designed and produced by them and in connexion with which certain novel patents have been taken out. This machine is perhaps the most rapid producer in the world